

Interactive comment on “Dangerous degree forecast of soil and water loss on highway slopes in mountainous areas using RUSLE model” by Yue Li et al.

Anonymous Referee #1

Received and published: 2 March 2018

This paper asks a novel and well-justified question about how to estimate soil loss on highway slopes. The authors state that most work to date on this area has been on natural slopes, and present some striking statistics about the area covered by highway slopes. However, the paper is extremely hard to read - it assumes a lot of prior knowledge about the RULSE model, does not define variables clearly and is written in long, dense and technical paragraphs. In its current draft state, it is hard to address the scientific quality of the paper in depth because it is hard to read and follow. For this reason, I would recommend major revisions to work on the communication of the paper before the content can be reviewed in detail.

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I have listed suggested revisions below in the approximate order in which they appear in the paper. These are a mix of medium and minor level revisions.

General - The English language needs work in places - at times, the language is very dense and sometimes the incorrect tense is used. Please proofread or consult a proof-reader.

The abstract is very long, this should be shortened to around 300 words.

The introduction assumes a large amount of prior knowledge about the RULSE model and the parameters that go into it. Please give more background. Imagine the audience was a highway manager, please state more clearly what the implications of previous research are in practical terms.

Paragraph starting on line 57. Many of the sentences need a citation to existing peer review or grey literature.

Line 62. 50 - 70 thousand should be changed to 50,000 - 70,000 m²

General - please ensure numeric units are described consistently and using SI units.

General - please only use author's last name for citations. E.g., line 73 should be Tresch et al. (date), not Tresch S et al (date).

Line 80 and 81, please ensure variables such as LS and S are defined

Line 84. This sentence needs restructuring as when you say 'this study', it sounds as though you are talking about primary research.

Paragraph starting on line 73 is very long (in excess of a page), and should be broken down into shorter paragraphs.

Line 96. Please state what 'K' is.

Line 101 Please state what 'C' is.

Paragraph on line 122 needs more citations to existing literature. E.g., the sentence on

line 125 should have a citation. Line 142, Please define what C and P factors are. This is confusing to talk about multiple parameters in the introduction without describing what they are.

Section 2 - please add references throughout this paragraph. Many of the statements made should have a citation e.g., about the seasonal regime of the area.

Section 3 - please use the Harvard reference system to cite each dataset

Section 3.1.2 Is the 's-shaped sampling method' already established in the literature? If so, please cite the literature. If not, please give more detail on this method.

Section 3.1.4 Is the imagery pixel size 8 m x 8m? If so, please state it in this way.

Section 2.2 give a citation for the RULSE equation.

Section 3 general - the sub-section numbering switches from 3.X.X to 2.X.X - please check the numbering is in order

[The following sections no longer have line numbering, so I will try to give detail on where I am referring to]

Section 4.1 The sentence referring to ArcGIS software needs further explanation. Why was it necessary to vectorise the data? What does the vectorisation have to do with soil erosion prediction?

Section 4.1 sentence starting 'The natural and artificial slope catchment watershed.' - the final statement 'such as property' needs clarification

Section 4.1.1 please provide a citation for the ArcGIS tool

Section 4.1 general - some of this information feels like it belongs in the methodology rather than results

The results section of the paper is highly technical, and currently would be more suited to an engineering type journal. Please consider the title of the journal and the likely

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audience. Try to tell a more logical story of why certain methods have been used, and think about what information is useful to the reader. Some information could possibly go in supplementary material.

Section 4.2.1 Please state what the interpolation calculations are

Table 1 and Table 3 Please make clearer what the section of expressway names actually refer to. I.e., how would I find 'K83+500~K84+900' on a map?

General. When referring to equations, do not refer to the authors by name and then cite. Also, check the spelling of author names is consistent and do not use author first names. For example in section 4.2.3, a sentence reads: If the slope is less than 18°, then the formula proposed by McCool et al (Mccol et al., 1987) was used. This should be rewritten as something like: If the slope is less than 18°, then the formula of McCool et al. (1987) is used

Section 4.2.5 How was NDVI calculated? What data was used?

Section 4.3 How were the field measurements taken in 2014?

Section 4.3 Please state why the RMSE is within an acceptable range

End of Section 4.3 The idea that the model may be defective needs further discussion. What might the uncertainties be? Why are the difference between monitoring and analogue spatially variable?

Page 27. Can you provide any recommendations for how soil and water conservation measures could be rationally adjusted?

Discussion - please comment on how meaningful these methods and results might be in other locations? Is this a site-specific study or does it have wider relevance elsewhere?

Conclusion. Please write this in paragraphs, not numbered sections. Please define variables again.

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